Good Environmental Practice for Winter Crops

DairyNZ beef+lamb new zealand horizons regional council HAWKE'S BAY REGIONAL COUNCIL

Wintering – Good environmental practice

Winter is a critical period for ensuring sufficient feeding levels to achieve livestock maintenance and production targets. Winter crops can contribute disproportionately to losses of nitrogen (N); phosphorus (P); sediment and bacteria such as E.coli from the farm or grazing system.

This guide provides solutions to minimise the environmental impacts of using winter crops and includes tips on managing the following:

Paddock selection | Overland flow | Cultivation | Strategic crop grazing

Successful wintering will also:

- Help to achieve body condition targets
- Be cost-effective
- Provide feed when grass supply is short
- Complement the overall farm system
- Be sustainable for people, livestock and the environment
- Help minimise contaminant loss to the environment and comply with local regulations
- Protect valuable topsoil.

Good management – cost effective wintering solutions

Good wintering practice doesn't need to cost more. By taking into account the areas of environmental risk on your farm, a suitable winter cropping and grazing plan can be put together which will decrease the environmental impact of wintering.

Your regional council will have specific rules relating to winter crops and break feeding. If you are keeping stock on the paddock after the crop is gone or are feeding additional supplement on the crop we advise that you seek advice from your regional council.

Critical source areas

Critical source areas (CSAs) are the parts of your farm that lose much higher levels of sediments and nutrients to water compared to the rest of the farm. Identifying CSAs and managing them will help you to prioritise your time and money to achieve the best reduction in your environmental footprint

What are critical source areas in crops?

Winter grazed forage crops are a major CSA on farm. They may also have a collection of CSAs within them. Managing these CSAs, and employing strategic grazing, can reduce phosphorus and sediment loss from crops by 80-90%. CSAs in crops include:

Streams and waterways

Particularly those with no stock exclusion or buffer zones. Sediment and phosphorus can reach waterways through direct deposition of poo, trampling of banks or overland flow

Low-lying parts of paddocks such as gullies and swales.

These areas can accumulate sediment and phosphorus which can move in overland flow.

Steep or eroding areas

Cropping steep areas increases the risk of sediment and nutrient loss.

Areas where stock congregate

Water troughs, feed bins, or gateways etc. often have a build-up of effluent and exposed soil.

Subsurface drains

These drains can give contaminants a direct route to waterways

Selecting crop paddocks

Many paddocks have challenging features which can increase the risk of contaminant loss, such as slopes or waterways. Paddock selection needs to consider the environmental risks and how these will be minimised. If the risks are too great or cannot be minimised, a different paddock should be considered.

If possible avoid paddocks with:

- Waterways near or in the paddock, especially if they are not fenced
- Gullies, swales or other natural drainage channels that run in times of high rain
- Soil types that are vulnerable to pugging and compaction particularly clays
- Significant artificial drainage such as mole and tile drains
- A lack of easy access to water troughs.

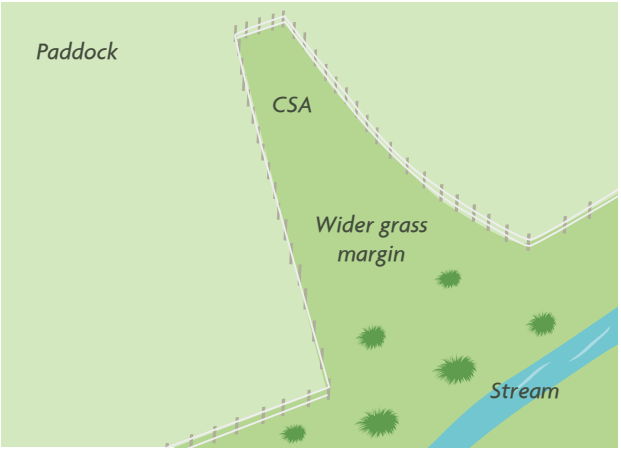
Crop paddocks that are steep and have waterways or CSAs will be harder to manage than those without them.

TIP

For more advice on crop paddock selection check out DairyNZ's crop paddock selection factsheet: dairynz.co.nz/crop-paddock-selection.

Filtering overland flow

Buffer zones or grass strips in and around critical source areas; especially gullies, swales and, next to waterways, act as filters by slowing overland flow to trap suspended contaminants. The buffer zone should be left uncultivated and ungrazed to operate effectively. The faster the water is flowing into a buffer zone, the wider the buffer zone will need to be to provide time for effective filtering. This is particularly important on sloping land.



Buffer zone fencing in a CSA.

Good use of grass buffers in crop paddocks.

Unmanaged CSAs without buffer zones can lead to loss of soil and nutrients.

Establishing crops

Where possible use direct drilling or minimum tillage when establishing crops.

Actions when cultivating

- When it is safe to do so, cultivate across slopes rather than up and down to slow down overland flow (Figure 1)
- Leave grass strips across slopes of cultivated paddocks to act as filters to trap sediment running off cultivated areas (Figure 1)
- Understand where water flows in a paddock during wet periods. Avoid cultivation in critical source areas (CSAs) such as seeps, gullies and dry streambeds, to minimise soil loss (Figure 2).

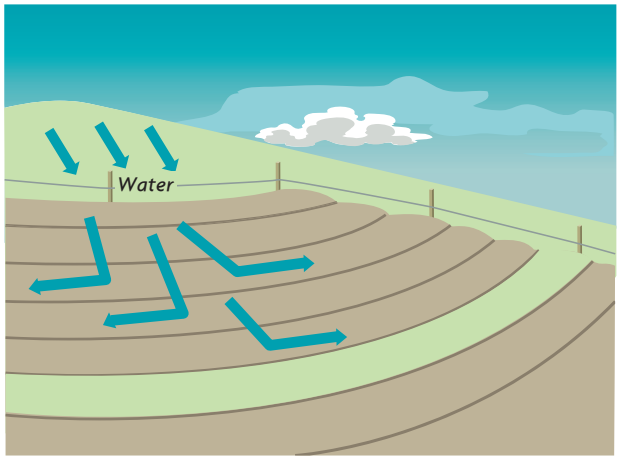


Figure 1. *Cultivate across slopes where possible to reduce soil loss by redirecting water flows. Leaving grass strips will provide a filter and slow water movement.*

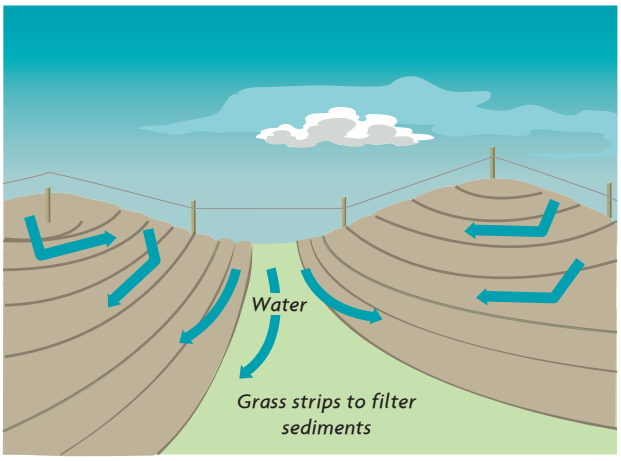


Figure 2. *Leaving grass strips undisturbed in gully/swale areas helps to trap sediments.*

Benefits of improving cropping areas

Reducing soil disturbance and minimising overland flow will mean less sediment and nutrients entering waterways.

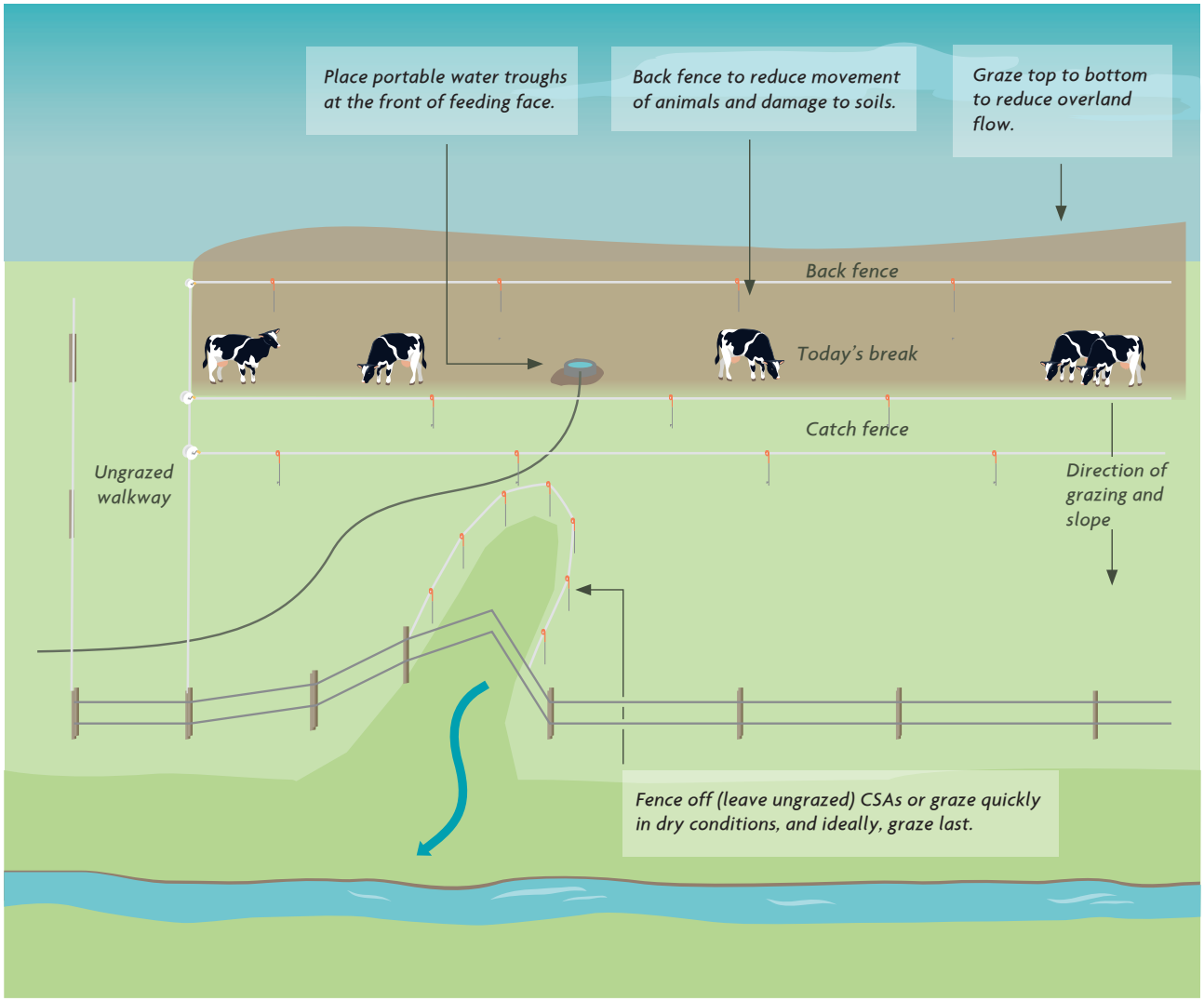
Reducing erosion of cropping areas minimises the risk of seed or crop loss at establishment and helps retain valuable topsoil

Grazing a CSA last, when conditions are drier, reduces nutrient and sediment loss.

Good practice winter crop grazing

Strategic winter crop grazing is a planned approach which helps to improve utilisation of crops, animal condition and environmental performance.

Key actions for good practice winter crop grazing



Benefits of good practice winter crop grazing

Strategic crop grazing and management of CSAs can reduce losses of sediment and phosphorus by 80-90%

Avoiding wet areas as much as possible is important for maintaining and improving general stock wellbeing

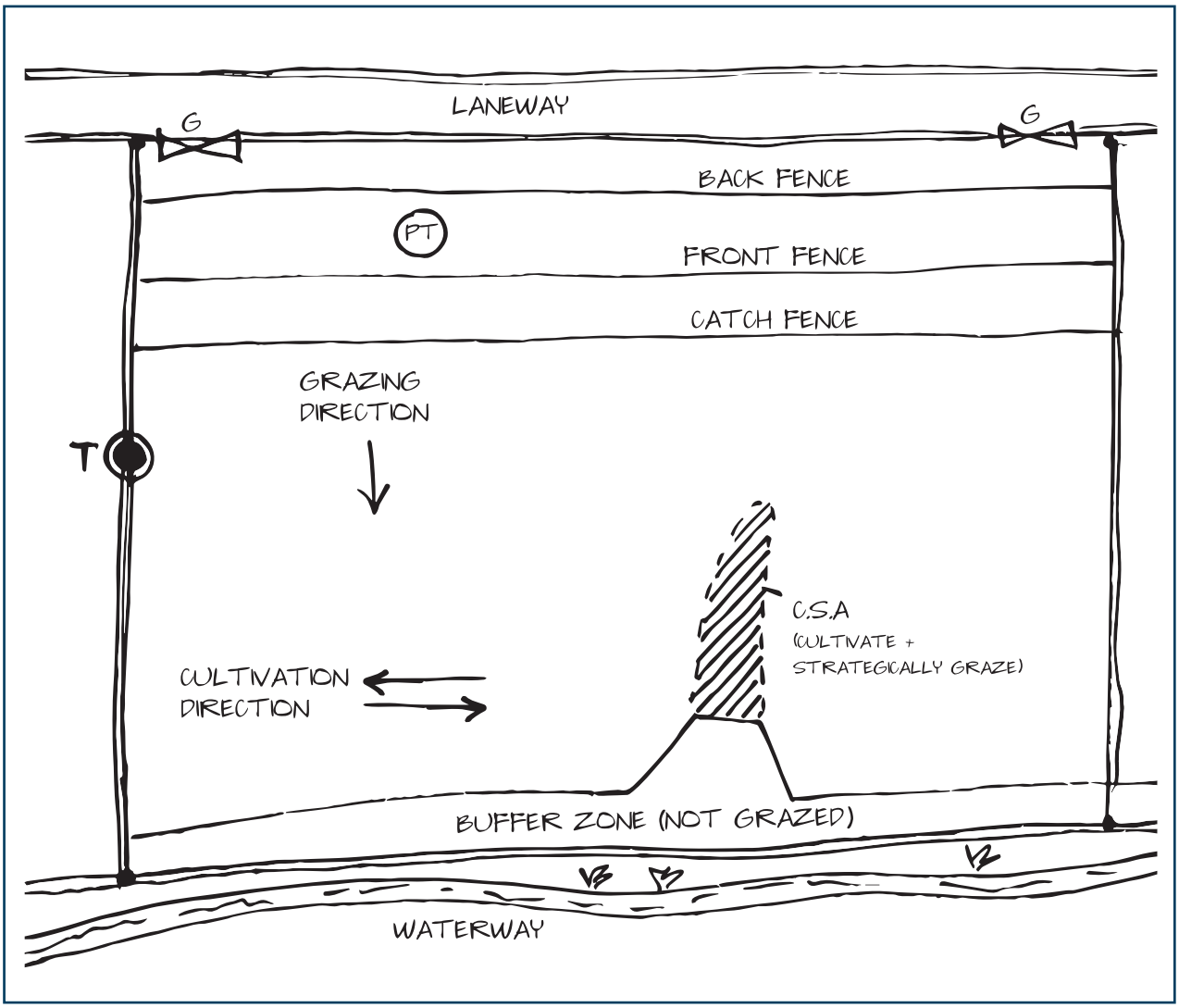
Good practice will retain more nutrients in your crop paddock reducing the need for additional fertiliser

Adapted from Dairy NZ DNZ 40-023, January 2017

For more advice around winter crops or anything in this guide, contact your Regional Council Land Management Team or your Industry Good organisation.

Winter cropping and grazing plan (example)

Farm name: CROPPING FARM Paddock: 15 Date: 14TH OCTOBER



Step 1: Draw an outline of the paddock	Symbol or Complete (tick)
Paddock number	15
Note map direction (e.g. North arrow)	N
Mark on obvious features	✓

Step 2: Identify risk areas/ paddock features	Symbol or Complete (tick)
Critical source areas and slopes (not to be cultivated)	C.S.A
Waterways and wetlands	
Gateways	G
Troughs	T

Step 3: Plan	Symbol or Complete (tick)
Direction of cultivation	←
Direction of grazing	→
Buffer zones	✓
Critical source areas that are to be strategically grazed	
Portable troughs	PT
Back fence	✓
Front grazing fence	✓
Catch fence (tomorrow's grazing fence)	✓

Winter cropping and grazing plan template

Farm name: _____ Paddock: _____ Date: _____

Step 1: Draw an outline of the paddock	Symbol or Complete (tick)
Paddock number	
Note map direction (e.g. North arrow)	
Mark on obvious features	

Step 2: Identify risk areas/ paddock features	Symbol or Complete (tick)
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Waterways and wetlands	
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Troughs	

Step 3: Plan	Symbol or Complete (tick)
Direction of cultivation	
Direction of grazing	
Buffer zones	
Critical source areas that are to be strategically grazed	
Portable troughs	
Back fence	
Front grazing fence	
Catch fence (tomorrow's grazing fence)	